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ABSTRACT

Art history is a hybrid discipline that combines the verbal with the visual, yet the limiting verbal approach traditionally has defined the field. Another problem at the university level is that different types of classes define visually literacy differently; for example, art education programs emphasize perceptual and cognitive angles while art history stresses cultural values. The interactive software example, "Space: The Visual Frontier," represents an intermediate step between the heavy dependence on words and the rigorously visual approach that will be coming in the near future. The program focuses on the development of linear perspective in early fifteenth century Italy, and possesses many qualities that other educational software should emulate. It shows visual restraint to make sure that form does not interfere with content, and it targets key figures with animated overlays. It also allows for image manipulation and kinevisual testing. Appendices contain sample quotes from student responses to using the program and twelve illustrations directly from the program. (BEW)

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DESIGNING VISUAL METHODS OF COMMUNICATING VISUAL CONTENT WITH ART HISTORY SOFTWARE

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by
Ellen Schiferl

ED 393 422

Words vs. Images

Art history is a hybrid discipline that combines the verbal with the visual, yet verbal communication traditionally has defined the field. In class, students hear words and see slides but they take verbal notes and thus words become the basis for studying and understanding. Words dominate the scholarly approach to art history as well because academe can assess verbal publications more easily in tenure and promotion and because photos, particularly color photos, are expensive to reproduce. Unfortunately, words provide a limited vehicle for communicating visual ideas. Our eyes perceive an immense variety of colors, textures, and shapes that allow us to make an almost infinite number of visual distinctions that words cannot communicate. With a greater reliance on visual means to teach visual concepts, art history could be taught more effectively.

Paths to Visual Literacy

At the university level, art history courses, like studio and art education courses, play a vital role in communicating the importance of visual literacy, yet each art discipline defines visual literacy differently:

- Art appreciation and studio courses emphasize art terms and visual elements (Dondis, 1973).
- Art education focuses on perceptual and cognitive approaches (Arnheim, 1969; Gombrich, 1956).
- Art history currently stresses cultural values such as the significance of afterlife in Egypt or harmony in Japan.

My art history curriculum moves beyond cultural context toward an even more fundamental question: How do people in a particular culture perceive reality? Here *world view* becomes a perceptual concept. As an extension of the mind, our eyes construct the visible world for us. While the biological mechanism for perceiving images is common to human beings, these images are processed by selecting certain forms. The mind selects forms on the basis of their importance and thus the perception of reality interconnects with what a culture deems important. Art cannot reproduce the reality of the eye but it can reveal the visual emphasis and spatial logic of a particular society. Further, art functions as both a passive reflection of perceptual systems as well as an active agent in generating those systems. By studying the art of different cultures we gain a better understanding of different patterns of thought.

Software example

The interactive software example used in this essay, *Space: The Visual Frontier*, represents an intermediary step between the heavy dependence on words characteristic of current art history instruction and a more rigorous approach to communicating visual concepts through visual means which will be presented in the near future. In the *Visual Frontier* software, most screens are evenly divided between text and visuals, but in contrast to publications and slide lectures, many of the visuals include animated overlays and diagrams to relay concepts.

The program focuses on one of the most significant shifts in the history of representation globally, the development

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of linear perspective in early fifteenth century Italy. Typically art historians teach linear perspective as an advanced method of representing the visible world that signaled an increased interest in the physical rather than spiritual environment. Today many North Americans regard linear perspective as realistic and more sophisticated than other methods of two dimensional representation. The program delves into the religious, economic, and scientific sources of linear perspective and the examples for this paper stem from the religious section featuring Bernardo Daddi's *Meeting at the Golden Gate* (14th century), Masaccio's *Trinity* (1420s), and Leonardo da Vinci's *Last Supper* (1490s).

After outlining some Medieval perspective techniques, such as hierarchical scale (Figure 4), the program shows how Christian art communicated spiritual content through spatial organization. The placement of images of God the Father, the Holy Spirit, Christ, the Virgin Mary, St. John the Evangelist, and the male and female donors follows established conventions for conveying the relative importance of each figure by aligning them according to the centric, vertical, and depth hierarchies (Figures 5-8). These visual hierarchies spurred the development of linear perspective (Figures 9-10) and explain why linear perspective flourished in religious images. Far from developing in opposition to Christian spirituality, linear perspective reinforced religious models.

Visual Restraint

Educational software should be visually appealing to the user but designers should exercise discipline to ensure that form does not interfere with content. The primary challenge in designing the *Visual Frontier* program was to keep the text, graphics, and background from competing with the illusionistic techniques of the paintings. However, completely flat graphics would appear dated in comparison to Macintosh system 7 icons. As the focal point of the program's content, Masaccio's *Trinity* determined the color harmonies for the entire program and buttons composed of six shades of gray presented a shallow three dimensional frame for easy recognition.

Visual Targeting

I began designing computer tutorials when I realized that computer animations would be more effective than waving my hand before a projected slide to make different points about the direction of the eye or the relationship of the figures. In the program, animated overlays serve a variety of purposes. The white oval in Figure 4 identifies key figures, the red lines reveal the spatial structure in Figures 6 and 7, and the orthogonal lines link the viewer's space to the projected space of the painting in Figure 10.

Image Manipulation

Slide comparisons, a standard technique of art history instruction, clarify the differences between two artists, themes, or cultures by juxtaposing images. In the *Visual Frontier*, transformation, rather than juxtaposition, reinforces the difference between Medieval and Renaissance approaches to space which students often find difficult to comprehend.

To dramatize the differences between the *hierarchical scale* of the Middle Ages (where the size of the object is determined by its importance, Figure 4) and the *hierarchical depth* of the Renaissance (where the size of the object is determined by its distance from the viewer, Figures 8 and 10), the program transforms the visual structure of the Renaissance painting into the visual structure of a Medieval artwork. The figures expand or shrink according to their spiritual significance and since the background no longer needs to be an extension of the viewer's space, it becomes a uniform gold field (Figures 11, 12). By transforming one visual logic system into another, students recognize the spatial order governing different representational approaches.

Kinevisual Testing

Computer programming allows the user to move an object form one place to another on the screen. With kinevisual interaction, the viewer can engage in the decision making process of the artist and appreciate the significance of the artist's choices. The example in Figure 3 represents one of the simplest applications of kinevisual testing and follows an animated diagram that replicates a Renaissance method for producing linear perspective. To connect this technique to Leonardo da Vinci's *Last Supper*, students view the painting, mentally determine the location of the vanishing point, and then manipulate the mouse to superimpose the red dot on the vanishing point. Depending on the student's action, the response varies from "You found it!" to "Close enough!" to "Please try again."

Student Responses

The *Visual Frontier* was tested and qualitatively evaluated in four different courses with three different instructors (Art History survey from Paleolithic through Medieval, Art History survey from Renaissance through the 20th century, Cross-cultural Perspectives in Art History, Renaissance Art). The evaluations served as a means to an end--a better program, rather than as a research tool for its own sake. Responses to the open ended questions improved subsequent versions of the program and provided insights into the value of computer based instruction (CBI).

In the first version, students complained that the structure returned users to the main menu at the end of each unit. While nonlinear approaches are often touted as a major advantage of CBI, students feared they would miss a section. As a result, later versions allowed students to move through the entire program using the forward arrow or select a particular section with pull down menus.

As expected, students responded favorably to the interactive and multimedia aspects of the program and saw CBI as an alternative to books rather than to the classroom. When asked specifically whether they would rather use a computer or a textbook, 68% preferred the computer, 9.5% preferred the textbook, and 23.5% wanted to use both, a surprising response for a student body composed of 85% non-traditional students with an average age of 26.

Sample comments from one class:

- I would rather use the computer. It, depending upon the program, forces you to make decisions as you go along. A book throws a list of questions at you typically at the end of the chapter.
- The computer made it much more interesting. The info broken up into sections made it a lot simpler to digest rather than sitting down with a whole text.
- The advantage to using a textbook is that you can do it anytime and anywhere. I felt like I had accomplished more using the computer. It was more interesting and fun.
- The computer is less hard on your eyes and you are a more active participant.
- The more senses used, the greater the learning--hearing, reading, and interacting with the computer are all valuable.
- To be honest, art history is not my favorite subject to study. Using the computer program, I got to take a more active part in the learning and it makes the material more exciting for me. Using sight, sound, and touch to learn has a lot of advantages--it keeps you focused *a lot* longer.
- Yes, the moving visual displays

convey the point much easier.

- I like being actively involved in. . . seeing things move as demonstrations. So many times when you read a book the illustrations are barely skimmed over; on the computer you can't help but see the point being made and you can't help but learn because you are involved actively.

- I like the action part of the program. It added a bit of life to the assignment. I was curious to see what would happen.

Challenge for the Future

Computer programs provide one route to developing more visually direct methods of teaching art history. As visual media, computer technologies stimulate new ways of communicating concepts and we have only glimpsed their potential for new approaches to instruction. One of the major challenges for instructional software designers is to create programs that stretch beyond the distillation of information and the appeal of multimedia presentation to a more comprehensive approach that stimulates another level of thinking. As an intermediary step, the *Visual Frontier* demonstrates more visually oriented pedagogical tools but the ultimate goal is a new level of visual thinking for the discipline of art history. By reshaping the art history curriculum toward more visually oriented methods of communicating visual content, students will receive a clearer message about the significance of the visual knowledge.

Credits

The following have all been reproduced courtesy of Art Resource, Inc.:

Bernardo Daddi, *Meeting at the Golden Gate*, predella panel from *Madonna and Child with Saints* polyptych (Florence, Uffizi), tempera on wood.

Masaccio. *Trinity*. (Florence, Sta. Maria Novella), fresco.

Leonardo da Vinci. *Last Supper*. (Milan, Sta. Maria delle Grazie, refectory), fresco.

References

Arnheim, R. (1969). *Visual thinking*. Berkeley, CA: University of California Press.

Dondis, D. (1973). *A primer of visual literacy*. Cambridge, MA: Massachusetts Institute of Technology Press.

Gombrich, E. (1960). *Art and illusion. A study in the psychology of pictorial representation*. Princeton, NJ: Princeton University Press. (reprint: 1989)

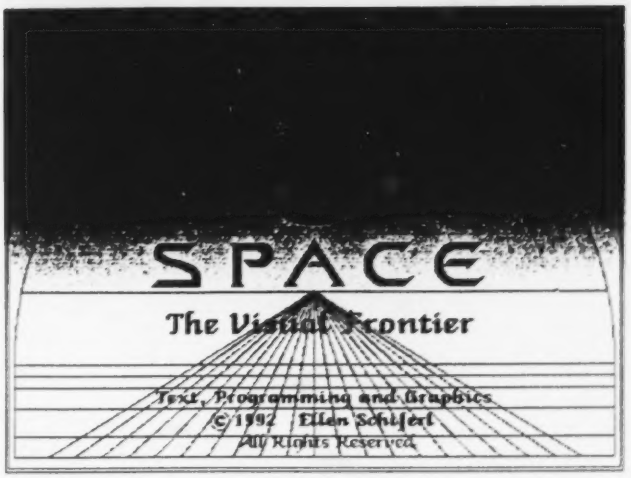

figure 1

Software:	**Space: The Visual Frontier. Linear Perspective.**
Author:	Ellen Schiferl, University of Southern Maine
Format:	One 1.4 M floppy disk including program, sound, images.
Computer:	Macintosh with 8 bit color, 13" or larger screen.
Level:	Advanced high school or university.
Contents:	Who/When/Where: Historical background
	What: Perspective methods defined with animations
	Why: Religious, economic and scientific context.
Features:	Animated diagrams and overlays explain key concepts. Sound: music interludes and pronunciation of names.

figure 2

figure 3

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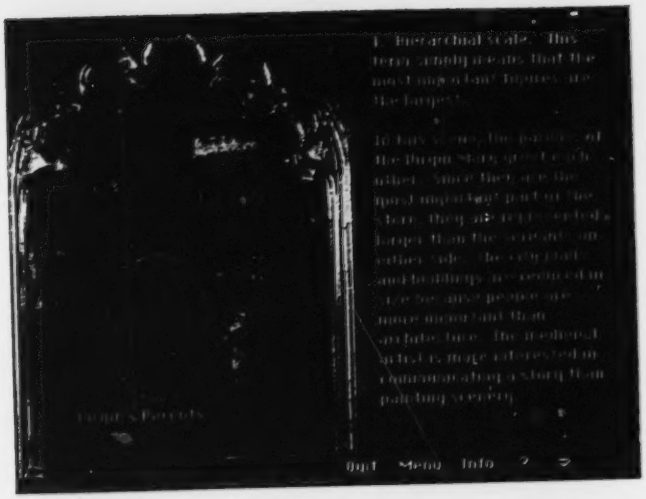

figure 4

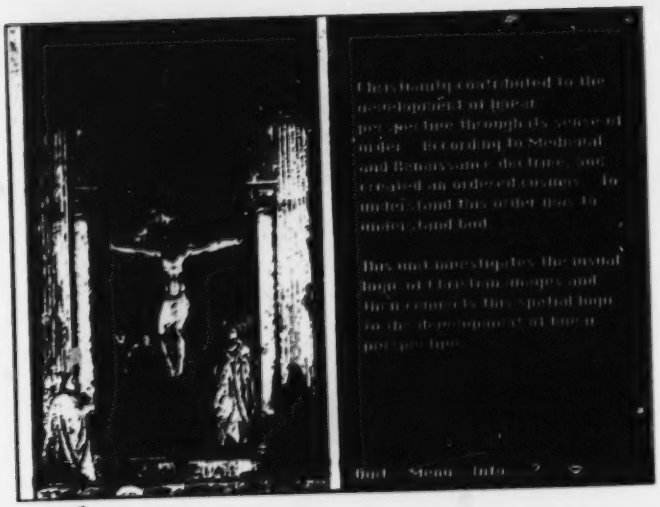

figure 5

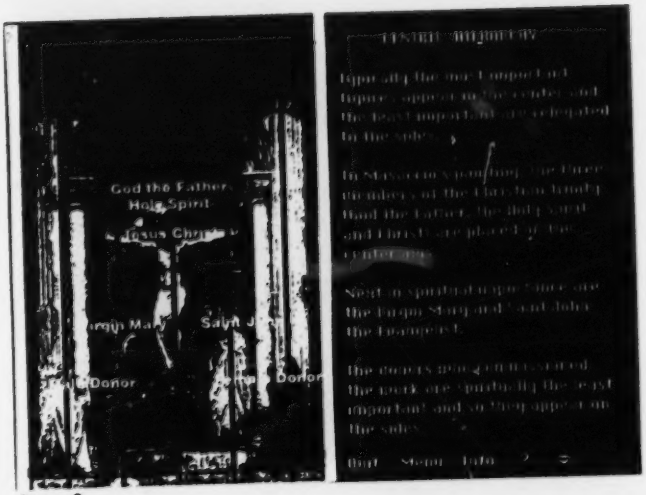

figure 6

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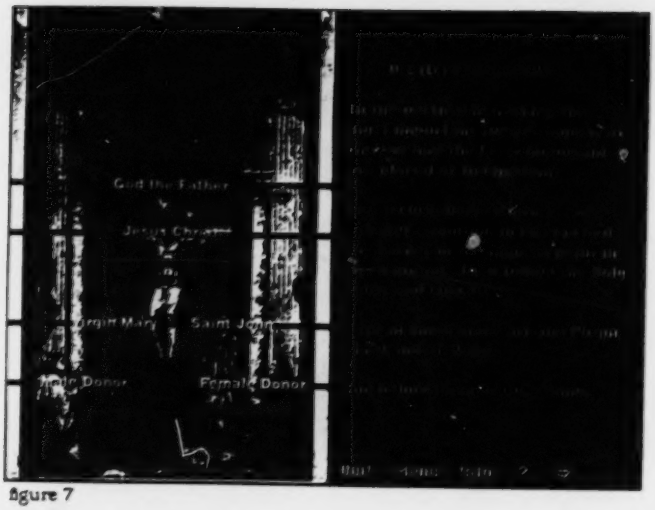

figure 7

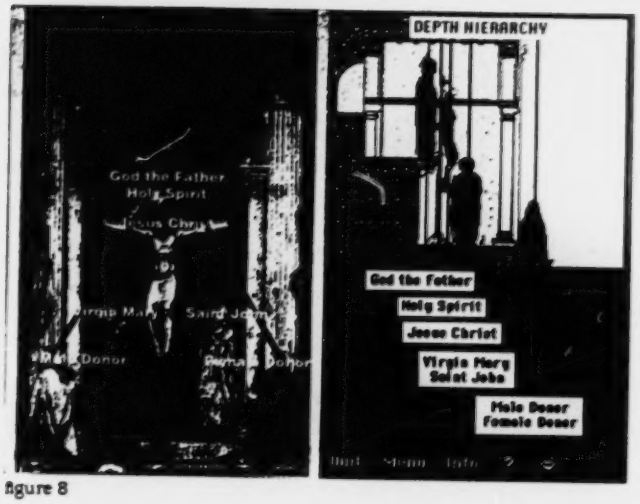

figure 8

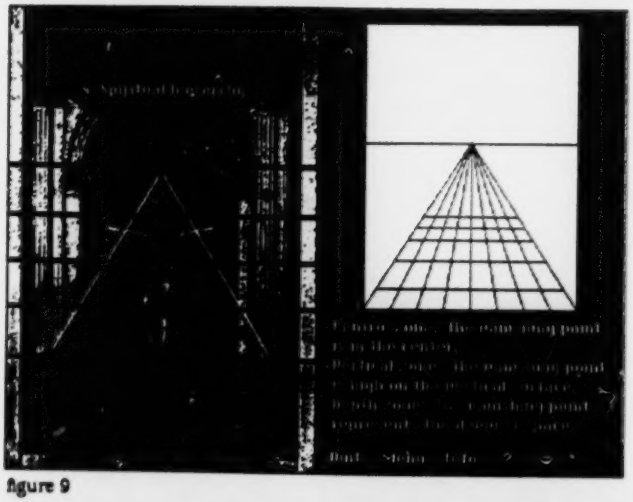

figure 9

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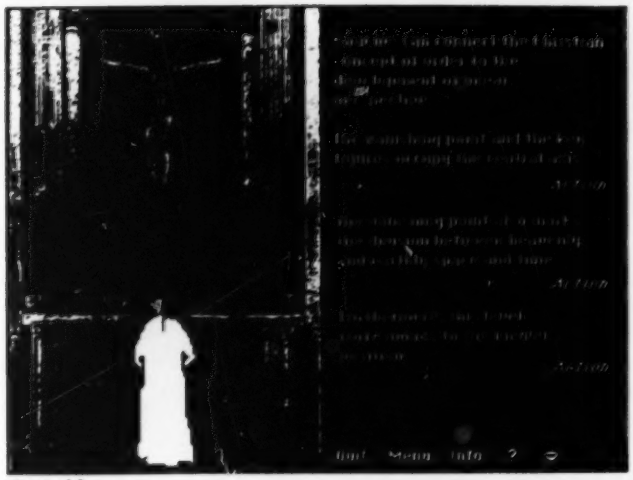

figure 10

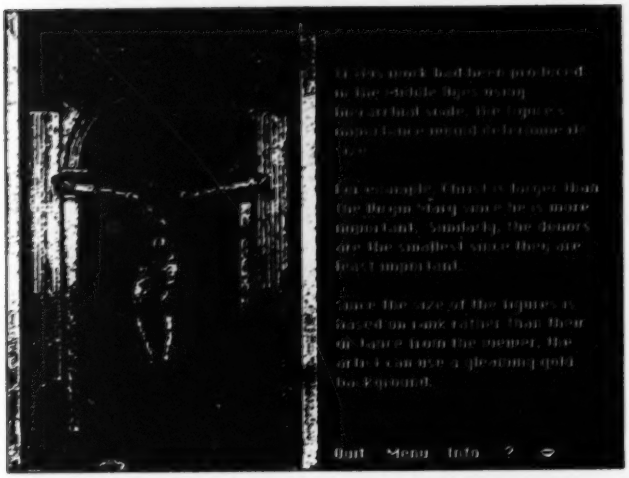

figure 11

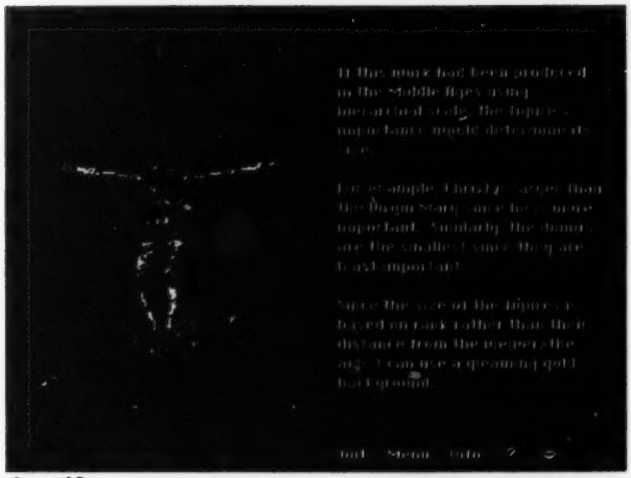

figure 12

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